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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,887	04/25/2006	Heinz Nelles	23234	6113

535 7590 04/06/2007

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EXAMINER	
MAI, NGOCLAN THI	
ART UNIT	**PAPER NUMBER**
1742	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/531,887	NELLES ET AL.	
	Examiner	Art Unit	
	Ngoclan T. Mai	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2 and 4-12* is/are rejected.

7)☒ Claim(s) *3* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/15/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Preliminary amendment filed 4/15/05 has been entered. Claims 1-12 are pending, wherein claims 3-4, 6-9 and 11-12 are amended.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 7 and 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 is indefinite because it does not further limit claim 6, which recites thermal binder-removing step conducted at temperature up to 270 C.

As for claim 12, a broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 12 recites the broad

recitation open porosity of at least 30% by volume, and the claim also recites 50% by volume, which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 4- 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,369,063, now Gee et al in view of U.S. Patent No. 4,011,291, now Curry.

Gee et al disclose a method for making metal filter medium, wherein the method comprises:

forming a mixture comprising ceramic powder, a polymeric binder and a pore former,

consolidating the mixture into a relatively dense self-sustaining body,

curing the binder,

removing the pore former, and

subjecting the shaped body to sintering temperature to form a porous sintered ceramic body with cell and interconnecting pores there between, col. 4, l. 5-37.

Gee teaches polymeric binder used can be either a thermosetting or a thermoplastic organic binder which can be pyrolyzed at temperature below the sintering or bonding temperature, col. 6, l. 45-49. Gee therefore implicitly teaches the binder can be removed

before sintering. Gee also teaches thermoplastic resin such as low or high density polyethylene are suitable where injection molding techniques are used to form the consolidated body, col. 7, l. 13-17. Gee teaches that the after consolidating the binder must be solidified, which phenomenon is known as curing, col. 7, l. 29-31. Gee teaches that when using thermoplastic resins, the pieces are allowed to cool and cure in the die to facilitate their removal from that die, col. 13, l. 1-3.

Gee teaching pore former can be removed by liquidfication by leaching with a solvent. An example of which is the use of calcium chloride as the pore former and leaching is done with water, col. 7, l. 47-55. The leaching is done by immersing the resin-cure green body in water, col. 11, l. 16-30.

Gee differs from claim 1 in that Gee does not teach setting the cooled body in a capillary-active material and subjecting the green body to a first stage binder removal to produce an open porosity.

Wei teaches a two stage debinding of injection molding powder compacts, wherein compact is subjected to a first debinding step in a presence of a wicking agent under gentle heating to remove a critical amount of binder from the object and a fast high temperature debinding stage to removal additional binder, col. 3, l. 15-23. Wei teaches the first stage wicking process partially open the pore structure thereby allowing rapid evaporation without cracking in the compact, in the second debinding stage, col. 5, l. 5-40. Wei teaches all debinding was in a dry hydrogen atmosphere, col. 5, l. 39-58.

In view of Wei's teaching it would have been obvious to one of ordinary skill in the art at the time the invention was made that the thermoplastic binder in the molded body of

Gee be removed by the technique taught by Wei for the fast removal of binder and without cracking of the compact.

As for claim 5 the temperature at which the thermoplastic binder, i.e., polyethylene is removed by the teaching of Gee in view of Wei is expected to be below 270 C since polyethylene has a melting point below 270 C.

Regarding claim 6, Gee teaches employing submicron starting powder for forming filter, col. 6, l. 31-36.

As for claim 7, Wei teaches for the second stage debinding, where polyethylene binder is used, the compact is heat to 450 C to evaporate the binder. Thus the second debinding stage of Gee in view of Wei is expected to carry out the temperature at claim.

As for claim 8, Gee teaches leaching the pore former from the body at temperature around 90 C and around 70-75 C, see col. 13, l. 35 and col. 14, l. 67. Gee does not teach lower temperature can be used, however the difference in water temperature used for leaching pore will not support the patentability of the subject matter encompassed by the prior art unless there is evidence indicating such temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation." See *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955); *In re Hoeschele*, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); *Merck & Co. Inc. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d (Fed.cir), cert. denied, 493 U.S. 975 (1989); *In re Kulling*, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990); and *In re Geisler*, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997). Furthermore, the specification contains no disclosure of either the critical nature of the claimed temperature range or any unexpected results arising therefrom. Where patentability is

said to be based upon particular chosen dimensions or upon another variable recited in the claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d, 1575, 16 USPQ2d, 1934 (Fed. Cir. 1990).

As for claim 10, Gee teaches the leaching can be done by placing the resin-cure green body in a water tank through which water was flowing, col. 15, l. 24-27. The flowing of water read on stirred water.

As for claim 11, Gee in view of Wei teach thermal binder-removing step use hydrogen instead of argon as a protective as claimed. However it is conventionally known the art organic binder removed can be carried out in reducing atmosphere such as hydrogen and nitrogen as well as in an inert gas such as argon. Thus it would have been obvious to one skill in the art to substitute hydrogen gas with argon in the thermal debinding step of Gee in view of Wei.

As for claim 12, Gee teaches forming porous filter where pore is formed in 65-75% by volume of the consolidation, see claim 20.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gee in view of Wei and U.S. Patent No. 5,051,182.

Gee differs from the claim in that Gee does not teach pore former is NaCl, KCl, K2CO3 or Na2CO3. However it known in the art to use water-soluble inorganic salt such as sodium chloride (NaCl), calcium chloride (KCl) and sodium sulfate as pore forming agent, see U.S. Patent No. 5,051,182. therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute any known pore forming agent as the pore forming agent in the method of making porous product of Gee in view of Wei. The use

of conventional materials to perform their known functions in a conventional process is obvious. In re Raner, 134 USPQ 343 (CCPA 1962).

7. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoclan T. Mai whose telephone number is (571) 272-1246. The examiner can normally be reached on 9:30-6:00 PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

n.m.

ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700